

What is claimed is:

1. A catheter having a proximal portion and a distal portion comprising:
a first elongate tubular body having a proximal portion, a distal portion, a
5 proximal end, a distal end, and a lumen extending between the proximal end and
the distal end;
a second elongate tubular body having a proximal portion, a distal portion, a
proximal end, a distal end, and a lumen extending between the proximal end and
the distal end; and
10 an elongate member joining the first and second elongate bodies,
the first elongate tubular body being disposed proximal and tandem to the second
elongate tubular body, and the first and second tubular bodies being permanently
disposed so that the first and second tubular bodies are not adjacent to each other,
further comprising a third elongate tubular body having a proximal portion,
15 a distal portion, a proximal end, a distal end, and a lumen extending between the
proximal end and the distal end,
at least the proximal portion of the third elongate tubular body being
disposed within the lumen of the first elongate tubular body, the third elongate
tubular body being slidable within the lumen of the first elongate tubular body, and
20 the distal portion of the third elongate tubular body being able to be
disposed in the lumen of the second elongate tubular body.
2. A catheter of claim 1, wherein the proximal portion of the third
25 elongate tubular body is maintained within the lumen of the first elongate tubular
body by one or more magnetic or mechanical stops.
3. A catheter of claim 1, wherein the entire third elongate tubular body
is able to be disposed within the lumen of the first elongate tubular body.

4. A catheter of claim 1, wherein the first elongate tubular body has an inner diameter and the elongate member has one or more transverse cross-sectional dimensions, each transverse cross-sectional dimension being less than half the inner diameter of the first elongate tubular body.

5. A catheter of claim 4, wherein each transverse cross-sectional dimension is less than one-quarter of the inner diameter of the first elongate tubular body.

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6. A catheter of claim 1, wherein the catheter comprises a single elongate member.

7. A catheter of claim 1, wherein the catheter comprises two or more elongate members.

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8. A catheter of claim 1, wherein the elongate member is a curved sheet that partially encircles the first and second tubular bodies.

9. A catheter of claim 8, wherein the curved sheet is made of knit, a weave, or tubular braid that has been folded upon itself to form a sheet.

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10. A catheter of claim 1, wherein at least a portion of the second elongate tubular body has a non-circular transverse cross-section.

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11. A catheter of claim 1, wherein the second elongate tubular body has one or more holes disposed in its proximal portion.

12. A catheter of claim 1, wherein the elongate member is cylindrical.

13. A catheter of claim 1, wherein the second elongate tubular body has an inner diameter that decreases from the proximal end to the distal end of the second elongate tubular body.

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14. A catheter of claim 1, wherein the second elongate tubular body is funnel-shaped.

15. A catheter of claim 1, wherein a proximal shaft is attached to the first
10 elongate tubular body.

16. A catheter of claim 15, wherein the proximal shaft is cylindrical.

17. A catheter of claim 15, wherein the proximal shaft and the elongate
15 member are formed of one cylindrical element.

18. A catheter of claim 1, wherein the first elongate tubular body has a length of from 10 to 200 cm.

20 19. A catheter of claim 18, wherein the first elongate tubular body has a length of from 15 to 100 cm.

20. A catheter of claim 1, wherein the second elongate tubular body has a length of from 10 to 50 cm.

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21. A catheter of claim 20, wherein the second elongate tubular body has a length of from 20 to 30 cm.

22. A catheter of claim 1, wherein the third elongate tubular body has a length of from 3 to 15 cm.

23. A catheter of claim 22, wherein the third elongate tubular body has a
5 length of from 5 to 10 cm.

24. A catheter of claim 1, wherein the first elongate tubular body has an inner diameter of from 0.02 to 0.10 inch.

10 25. A catheter of claim 1, wherein the second elongate tubular body has an inner diameter of from 0.01 to 0.12 inch.

26. A catheter of claim 1, wherein the third elongate tubular body has an outer diameter of from 0.02 to 0.10 inch.

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27. A catheter of claim 1, wherein the third elongate tubular body has an inner diameter of from 0.01 to 0.09 inch.

28. A catheter of claim 1, wherein the distance between the distal end of
20 the first elongate tubular body and the proximal end of the second elongate tubular body is from 1 to 10 cm.

29. A catheter of claim 1, wherein the catheter is selected from a balloon catheter, an infusion/dye-injection/suction catheter, stent delivery catheter, or an
25 embolic protection device delivery catheter.

30. A catheter of claim 29, wherein the catheter is a balloon catheter.

31. A catheter of claim 29, wherein the catheter is an infusion/dye-injection/suction catheter.

5 32. A catheter of claim 29, wherein the catheter is a stent delivery catheter.

33. A catheter of claim 29, wherein the catheter is an embolic protection device delivery catheter.

10 34. A catheter of claim 1, wherein the catheter comprises an interventional element on the second elongate tubular body.

15 35. A catheter of claim 1, wherein the first and second elongate tubular bodies are formed of one or more polymers.

36. A catheter having a proximal portion and a distal portion comprising:
a first elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end;

20 a second elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end; and

an elongate member joining the first and second elongate bodies, the first elongate tubular body being disposed proximal and tandem to the second elongate tubular body, and the first and second tubular bodies being permanently
25 disposed so that the first and second tubular bodies are not adjacent to each other,

further comprising a third elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end,

at least the proximal portion of the third elongate tubular body being disposed within the lumen of the first elongate tubular body, the third elongate tubular body being slidable within the lumen of the first elongate tubular body, and

wherein the third tubular body is able to be disposed in a first position so
5 that the second and third tubular bodies are not adjacent to each other and able to be disposed in a second position so that the second and third tubular bodies are adjacent to each other.

37. A catheter of claim 36, wherein the proximal portion of the third
10 elongate tubular body is maintained within the lumen of the first elongate tubular body by one or more magnetic or mechanical stops.

38. A catheter of claim 36, wherein the entire third elongate tubular body
is able to be disposed within the lumen of the first elongate tubular body.

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39. A catheter having a proximal portion and a distal portion comprising:
a first elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end;

20 a second elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end; and

an elongate member joining the first and second elongate bodies,

the first elongate tubular body being disposed proximal and tandem to the
25 second elongate tubular body, and wherein the first and second tubular bodies are able to be disposed in a first position so that the first and second tubular bodies are not adjacent to each other and able to be disposed in a second position so that the first and second tubular bodies are adjacent to each other.

40. A catheter of claim 39, wherein the first elongate tubular body slides on the elongate member.

41. A catheter of claim 39, wherein the second elongate tubular body is
5 permanently fixed to the elongate member.

42. An assembly for delivering a catheter, the assembly comprising a guide wire and a catheter, the catheter having a proximal portion and a distal portion comprising:

10 a first elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end;

a second elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and
15 the distal end; and

an elongate member joining the first and second elongate bodies, the first elongate tubular body being disposed proximal and tandem to the second elongate tubular body, and the first and second tubular bodies being permanently disposed so that the first and second tubular bodies are not adjacent to each other,

20 further comprising a third elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end,

at least the proximal portion of the third elongate tubular body being disposed within the lumen of the first elongate tubular body, the third elongate
25 tubular body being slidable within the lumen of the first elongate tubular body, and

the distal portion of the third elongate tubular body being able to be disposed in the lumen of the second elongate tubular body.

43. An assembly comprising an embolic protection device and a catheter, /
the catheter having a proximal portion and a distal portion comprising:

a first elongate tubular body having a proximal portion, a distal portion, a
proximal end, a distal end, and a lumen extending between the proximal end and
5 the distal end;

a second elongate tubular body having a proximal portion, a distal portion, a
proximal end, a distal end, and a lumen extending between the proximal end and
the distal end; and

an elongate member joining the first and second elongate bodies,
10 the first elongate tubular body being disposed proximal and tandem to the second
elongate tubular body, and the first and second tubular bodies being permanently
disposed so that the first and second tubular bodies are not adjacent to each other,

further comprising a third elongate tubular body having a proximal portion,
a distal portion, a proximal end, a distal end, and a lumen extending between the
15 proximal end and the distal end,

at least the proximal portion of the third elongate tubular body being
disposed within the lumen of the first elongate tubular body, the third elongate
tubular body being slidable within the lumen of the first elongate tubular body, and

wherein the third tubular body is able to be disposed in a first position so
20 that the second and third tubular bodies are not adjacent to each other and able to
be disposed in a second position so that the second and third tubular bodies are
adjacent to each other.

44. An assembly comprising an embolic protection device and a catheter,
25 the catheter having a proximal portion and a distal portion comprising:

a first elongate tubular body having a proximal portion, a distal portion, a
proximal end, a distal end, and a lumen extending between the proximal end and
the distal end;

a second elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end; and

an elongate member joining the first and second elongate bodies,

5 the first elongate tubular body being disposed proximal and tandem to the second elongate tubular body, and wherein the first and second tubular bodies are able to be disposed in a first position so that the first and second tubular bodies are not adjacent to each other and able to be disposed in a second position so that the first and second tubular bodies are adjacent to each other.

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45. A method for positioning a catheter within a patient's blood vessel, the method comprising:

providing a catheter, the catheter having a proximal portion and a distal portion comprising:

15 a first elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end;

a second elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end; and

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an elongate member joining the first and second elongate bodies,

the first elongate tubular body being disposed proximal and tandem to the second elongate tubular body, and the first and second tubular bodies being permanently disposed so that the first and second tubular bodies are not adjacent to each other,

25 further comprising a third elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end,

at least the proximal portion of the third elongate tubular body being disposed within the lumen of the first elongate tubular body, the third elongate tubular body being slidable within the lumen of the first elongate tubular body, and the distal portion of the third elongate tubular body being able to be

5 disposed in the lumen of the second elongate tubular body;

providing a guide wire having a proximal end and a distal end;

advancing the guide wire to a target site within the patient's blood vessel;

disposing the guide wire proximal end within the lumen of the second elongate tubular body and not within the lumen of the first elongate tubular body;

10 and

advancing the catheter over the guide wire to the target site.

46. A method of claim 45, wherein the guide wire is removed from the catheter after the catheter has been advanced to the target site.

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47. A method of claim 46, further comprising, after the catheter has been advanced to the target site, advancing an interventional medical device through the lumens of the first and second elongate tubular bodies to the target site.

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48. A method of claim 47, wherein the interventional medical device is an embolic protection device.

49. A method of claim 45, wherein the proximal portion of the third elongate tubular body is maintained within the lumen of the first elongate tubular body by one or more magnetic or mechanical stops.

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50. A method of claim 45, wherein the entire third elongate tubular body is able to be disposed within the lumen of the first elongate tubular body.

51. A method of claim 45, wherein the first elongate tubular body has an inner diameter and the elongate member has one or more transverse cross-sectional dimensions, each transverse cross-sectional dimension being less than half the inner diameter of the first elongate tubular body.

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52. A method of claim 51, wherein each transverse cross-sectional dimension being less than one-quarter of the inner diameter of the first elongate tubular body.

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53. A method of claim 45, wherein the catheter comprises a single elongate member.

54. A method of claim 45, wherein the catheter comprises two or more elongate members.

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55. A method of claim 45, wherein the elongate member is a curved sheet that partially encircles the first and second tubular bodies.

56. A method of claim 55, wherein the curved sheet is made of knit, a weave, or tubular braid that has been folded upon itself to form a sheet.

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57. A method of claim 45, wherein at least a portion of the second elongate tubular body has a non-circular transverse cross-section.

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58. A method of claim 45, wherein the second elongate tubular body has one or more holes disposed in its proximal portion.

59. A method of claim 45, wherein the elongate member is cylindrical.

60. A method of claim 45, wherein the second elongate tubular body has an inner diameter that decreases from the proximal end to the distal end of the second elongate tubular body.

5 61. A method of claim 45, wherein the second elongate tubular body is funnel-shaped.

62. A method of claim 45, wherein a proximal shaft is attached to the first elongate tubular body.

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63. A method of claim 62, wherein the proximal shaft is cylindrical.

64. A method of claim 62, wherein the proximal shaft and the elongate member are formed of one cylindrical element.

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65. A method of claim 45, wherein the catheter is selected from a balloon catheter, an infusion/dye-injection/suction catheter, stent delivery catheter, or an embolic protection device delivery catheter.

20 66. A method of claim 65, wherein the catheter is a balloon catheter.

67. A method of claim 65, wherein the catheter is an infusion/dye-injection/suction catheter.

25 68. A method of claim 65, wherein the catheter is a stent delivery catheter.

69. A method of claim 65, wherein the catheter is an embolic protection device delivery catheter.

70. A method of claim 45, wherein the catheter comprises an interventional element on the second elongate tubular body.

5 71. A method of claim 45, wherein the first and second elongate tubular bodies are formed of one or more polymers.

72. A method for positioning a catheter within a patient's blood vessel, the method comprising:

10 providing a catheter, the catheter having a proximal portion and a distal portion comprising:

a first elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end;

15 a second elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end; and

an elongate member joining the first and second elongate bodies, the first elongate tubular body being disposed proximal and tandem to the second elongate tubular body, and the first and second tubular bodies being permanently disposed so that the first and second tubular bodies are not adjacent to each other,

further comprising a third elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end,

25 at least the proximal portion of the third elongate tubular body being disposed within the lumen of the first elongate tubular body, the third elongate tubular body being slidable within the lumen of the first elongate tubular body, and

wherein the third tubular body is able to be disposed in a first position so that the second and third tubular bodies are not adjacent to each other and able to

be disposed in a second position so that the second and third tubular bodies are adjacent to each other;

providing a guide wire having a proximal end and a distal end;

advancing the guide wire to a target site within the patient's blood vessel;

5 disposing the guide wire proximal end within the lumen of the second elongate tubular body and not within the lumen of the first elongate tubular body; and

advancing the catheter over the guide wire to the target site.

10 73. A method for positioning a catheter within a patient's blood vessel, the method comprising:

providing a catheter, the catheter having a proximal portion and a distal portion comprising:

15 a first elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end;

a second elongate tubular body having a proximal portion, a distal portion, a proximal end, a distal end, and a lumen extending between the proximal end and the distal end; and

20 an elongate member joining the first and second elongate bodies,

the first elongate tubular body being disposed proximal and tandem to the second elongate tubular body, and wherein the first and second tubular bodies are able to be disposed in a first position so that the first and second tubular bodies are not adjacent to each other and able to be disposed in a second position so that the

25 first and second tubular bodies are adjacent to each other;

providing a guide wire having a proximal end and a distal end;

advancing the guide wire to a target site within the patient's blood vessel;

disposing the guide wire proximal end within the lumen of the second elongate tubular body and not within the lumen of the first elongate tubular body;
and

advancing the catheter over the guide wire to the target site.

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74. A catheter of claim 1, wherein the second elongate tubular body has a side wall extending between its proximal and distal ends and a port disposed on the side wall.

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75. A method of claim 45, wherein the second elongate tubular body has a side wall extending between its proximal and distal ends and a port disposed on the side wall.

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